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| 10/527,719 | 03/14/2005 | Leslie Vincent Peddle Johnson | PIP0112PUSA | 7602 |

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| EXAMINER | |
|---|---|
| WU, IVES J | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/527,719 | JOHNSON, LESLIE VINCENT PEDDLE | |
| | Examiner | Art Unit | |
| | Ives Wu | 1797 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-15 and 18-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15,18-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/06/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

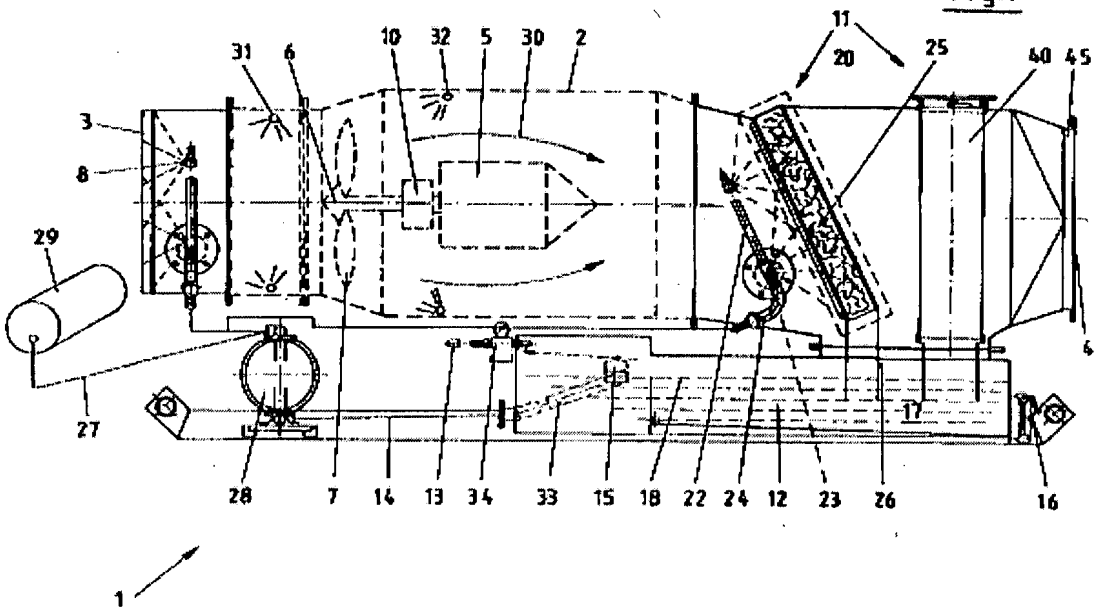
### *Claim Rejections - 35 USC § 102*

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(1). **Claims 1, 4-5, 7, 9-12** are rejected under 35 U.S.C. 102(a) as being anticipated by Both et al (US06312504B1).

Both et al (US06312504B1) disclose rotary washer with obliquely positioned demister (Title) for purifying dust-containing air, particularly in underground mining and tunnel construction (Abstract, line 1-2). As shown in the Figure 1 below:

Fig.1




As to a housing having an inlet and an outlet, the housing adapted to contain powered air induction means adapted to induce air contaminated with particulate matter into the inlet in a wet dust removal apparatus in **independent claim 1**, Both et al disclose the washing housing 2, inlet side 3 and outlet side 4, fan impeller 6 to drive the dust-containing air as shown in the Figure 1 above.

As to water spraying means adapted to spray a mist of water into the induced air stream to capture the particulate matter in **independent claim 1**, Both et al disclose water nozzle 8 and additional spray nozzles 32 as shown in the Figure 1 above. First of all, the water nozzles by

virtue of their clever arrangement ensure that the water droplets may bond very easily and reliably with the dust particles (Col. 2, line 62-65).

As to water removal means downstream of water spraying means adapted to remove water droplets containing the particulate matter prior to the air exiting the housing via the outlet in **independent claim 1**, Both et al disclose the demister as shown in Figure 1, which reads on the limitation of instant claim.

As to water removal means positioned in the housing parallel to the direction of the airflow in **independent claim 1**, Both et al disclose demister to be disposed as horizontally as possible in the air stream (Col. 2, line 10-11).

As to the parallel position, by presenting a minimal drag profile in the airflow reducing the air pressure and velocity required to remove dust for a given volume of air, and in use, the energy consumption of the air induction means to be thereby reduced in **independent claim 1**, in view of the substantially identical water removal apparatus such as demister of Both et al, it would fulfill the limitation of instant claim. A claim contains a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art" if the prior art apparatus teaches all the structural limitation of the claim. *Ex Parte Masham*, 2 USPQ 2d 1647 (Bd. Pat. App. & Inter. 1987).

As to vessel to be fabricated from sheet steel, which is welded or is of fiberglass or aluminum construction in **claim 4**, the product-by-process limitation of instant claim is rejected. *In re Thorpe*, 227 USPQ 964 (CAFC 1985).

As to directional vane members for directing the air flowing out through the outlet in a preferred direction in **claim 5**, Both et al disclose the mist collector 40 comprising a plurality of traps 41 and 42, as shown in the Figure 2 below, which reads on the features of instant claim.

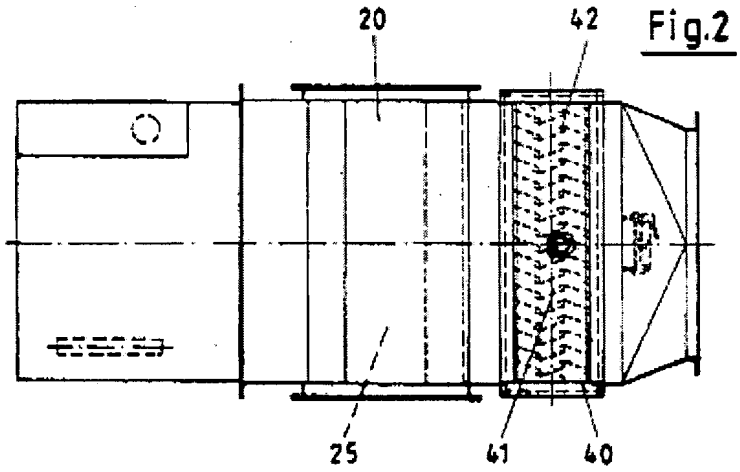


Fig.2

As to fan to be multi-bladed fan in **claim 7**, Both et al disclose blades of the fan impeller rotating in the air stream (Col. 4, line 4).

As to nozzles being connected to a manifold into which water is injected under pressure in **claim 9**, it is well known in the art that water spray through nozzle is by pressure.

As to mist eliminator fabricated from stainless steel or plastic filaments of various diameters and compositions in **claim 10**, Both et al disclose the woven steel material, which reads on the instant claim.

As to individual filaments to be between 0.05 mm to 2.5 mm in diameter in **claim 11**, 0.25 mm to 0.5 mm in diameter in **claim 12**, limitations are excluded for examination because the stainless steel is selected as the limitation of instant claim 10.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(2). **Claims 3, 6** and **8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Both et al (US06312504B1).

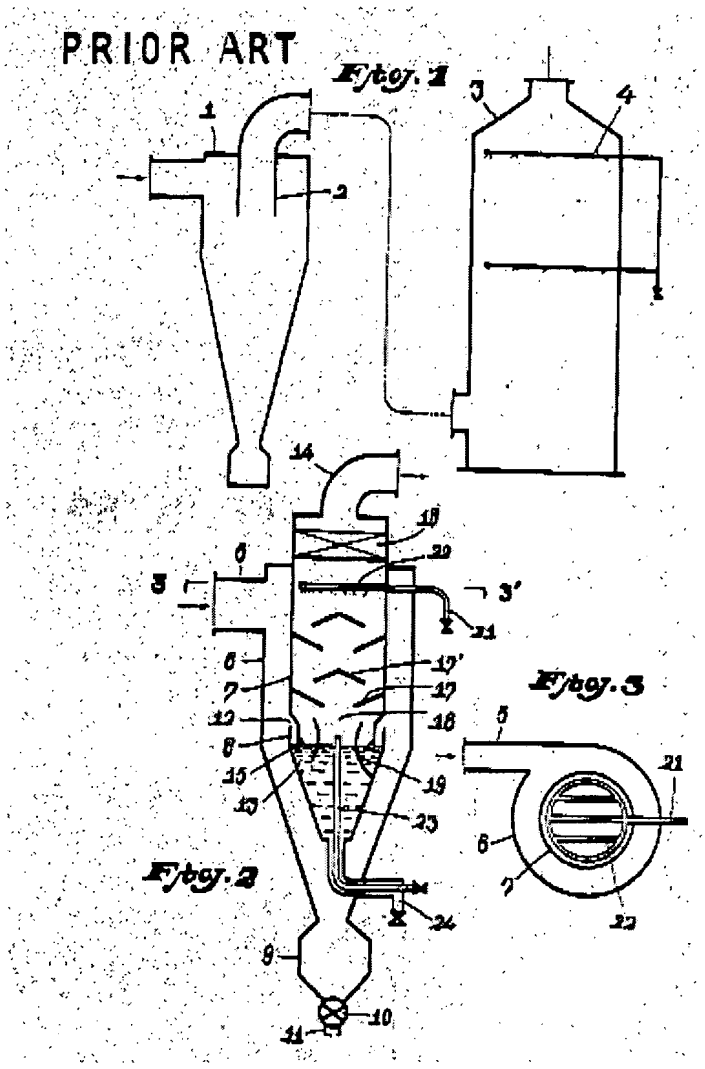
As to housing to be cylindrical shape in **claim 3**, it is obvious to have cylindrical shape of the housing, changes in shape does not affect functions. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

As to powered air induction means comprising electric or hydraulic mechanism in **claim 6**, it is well known in the art that fan is electrical device.

As to water droplets in order of 100 microns in size in **claim 8**, in absence of showing the criticality of the records, the optimized size of water droplets to be 100 microns or less in a known process render prima facie obviousness within one of ordinary skills in the art. *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).

(3). **Claims 2, 13** and **18-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura (US03527026) in view of Fisher (US02259034), evidenced by Chapman (US03727377), Cox (US04734109).

As to a housing having an inlet and an outlet, the housing adapted to contain powered air induction means adapted to induce air contaminated with large and small drilling particulate material from vicinity of a drilling operation into the inlet via a suction passage connected to the inlet in a wet and dry duct removal apparatus in **independent claim 2**, Miura (US03527026) discloses apparatus for treating a gas to remove impurities therefrom (Title). Generally speaking, the patentee's invention contemplates employing a dry-method and a wet-method separator, to efficiently separate or recover fine particles and poisonous gases generated at a chemical plant, food plant, machinery plant, an iron works, an electric power station and similar establishments (Col. 1, line 23-29). As shown in Figure 2 below, which includes an inlet 3, outlet 10 in cylinder 6:




Miura (US03527026) discloses air containing solid substances and poisonous gas is tangentially drawn into the cyclone 1 (Col. 2, line 11-13).

Although Miura does not disclose induction means to induce contaminated air, it would be obvious to one of ordinary skills in the art to have driving means for the transportation, as evidenced by Chapman (US03727377), a discharge fan 15 or input fan 15' in Figure 1.

As to cyclonic vacuum means adapted to remove by vacuum, the large and small particulate material in a wet and dry duct removal apparatus in **independent claim 2**, Miura discloses in the apparatus of a dry-method cyclone and a wet-method separator are combined into one unit (Col. 1, line 58-60).

As to water spraying means adapted to spray a mist of water into air exiting from the vacuum means to capture any fine dust particles escaping the vacuum means in a wet and dry duct removal apparatus in **independent claim 2**, Miura discloses the spray pipe 22 as shown in Figure 2 above, which meets the limitations of instant claim.

As to water removal means downstream of water spraying means adapted to remove water droplets containing the dust prior to the cleaned air exiting the housing via the outlet in **independent claim 2**, Miura discloses the dust-containing mist to be separated by a separator such as a mist separator 18, which may also include baffle plates 17 and 17' or an impact mechanism or an inertia mechanism (Col. 2, line 67-71).

As to the removal means positioned in the housing parallel to the direction of air flow wherein parallel position, by presenting a minimal drag profile in the air flow reduces the air pressure and velocity required to remove dust for a given volume of air and, wherein in use, the energy consumption of the cyclonic vacuum means is thereby also reduced in **independent claim 2**, Miura **does not teach** the parallel position of removal means as claimed.

However, Fisher (US02259034) **teaches** the spray eliminator plates 22 in the Figure 1, which reads on the limitation as claimed.

The mist separator of Miura is a generic demister, the spray eliminator plates of Fisher is specific demister, one of ordinary skills in the art would recognize that all specific demister would work well for generic demister. Motivated by a reasonable expectation of success. *In re O'Farrel*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).

As to cyclonic vacuum means comprising a cyclone type vessel removing particles larger than 1.0 mm in size by centrifugal action and small particles which do not conform to the physical forces to be captured by water spraying means in **claim 13**, Miura discloses the contained large-sized solid substances being separated centrifugally and precipitated. Thus the cyclone separates only solid substance, which are centrifugally separable by the dry-method. Consequently, air containing fine particles, which could not be separated by the cyclone passing into the wet-method washing-tower 3, so that fine particles in the gas can be wetted, absorbed, separated and eliminated (Col. 2, line 11-33). It would remove particle size larger than 1.00 mm as evidenced by (Cox - US04734109) that conventional cyclone separators work fairly well for

the classification of particles having nominal sizes greater than about 25 ~ 30 microns (Col. 1, line 46-48).

As to housing comprising a cylindrical vessel having inlet and outlet in **claim 18**, Miura discloses the contemplated apparatus consisting of a dual cyclone of the dry-method (Col. 1, line 58-59). As shown in the Figure 2 above, cylinders 6 and 7, which reads on the limitation of instant claim.

As to vessel to be fabricated from sheet steel, which is welded or is of fiberglass or aluminum construction in **claim 19**, the product-by-process limitation is rejected over a product. *In re Thorpe*, 227 USPQ 964 (CAFC 1985).

As to directional vane members for directing the air flowing out through the outlet in a preferred direction in **claim 20**, Fischer discloses the spray eliminator plates 22, which reads on the limitation of instant claim.

As to powered air induction means comprising an electric or hydraulic drive mechanism powering a fan in **claim 21**, Miura (US03527026) discloses air containing solid substances and poisonous gas is tangentially drawn into the cyclone 1 (Col. 2, line 11-13). Although Miura does not disclose induction means to induce contaminated air, it would be obvious to one of ordinary skills in the art to have driving means for the transportation, as evidenced by Chapman (US03727377), a discharge fan 15 or input fan 15' in Figure 1, which reads on the electric drive of instant claim.

As to water spraying means comprising a plurality of water spray nozzles adapted to spray water droplets in the order of 100 microns size in **claim 22**, in absence of showing the criticality of the records, the optimized size of water droplets to be 100 microns or less in a known process render prima facie obviousness within one of ordinary skills in the art. *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).

As to water removal means comprising mist eliminator fabricated from stainless steel or plastic filaments of various diameters and compositions in **claim 23**, to choose known material for suitability renders obviousness. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

(4). **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Miura (US03527026) in view of Fischer (US02259034), further in view of England (US05320188A).

as to the suction passage comprising a shroud surrounding the drill adapted to contain solid particles and dust, the shroud connected by a flexible corrugated hose to the inlet in claim 14, Miura, Fisher do not teach the apparatus for the suction passage as claimed.

However, England (US05320188A) teaches the apparatus including a shroud disposed around the drill bit to produce a confined for suspension of drilling debris. The debris is withdrawn under suction from the area by a conduit system associated with the shroud and a cyclonic filter structure (Abstract). Filter 14 is associated by connecting hose 32 to individual ports, as shown in Figures 1 and 2 (Col. 11, line 5-6).

The advantage of using this apparatus of shroud structure for the suction passage is well adapted for use in large underground mining operations (Col. 2, line 6-7). This method substantially increase the rate of penetration without causing excessive drill bit wear, further, less volume of compressed air then conventional surface drilling operations (Col. 3, line 22-35).

Therefore, it would have been obvious to install the shroud structure for suction passage disclosed by England for the inlet system of Miura, Fisher in the application of drilling environment in order to obtain the above-cited advantages.

(5). **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Miura (US03527026) in view of Fischer (US02259034), further in view of Brouwers (US04994097).

As to cyclonic means being electrically driven or by an internal combustion engine, typically a small diesel engine in **claim 15**, Miura and Fischer **do not teach** rotating cyclone as claimed.

However, Brouwers (US04994097) **teaches** a rotational particle separator (Title) and a driver for rotating the centrifuge (Abstract, line 6). It would be obvious to have electrical power for the driver as well known in the art.

The advantage of using rotating particle separation is the degree by which small sized particles can be collected being improved by increasing angular velocity, reducing the radial width of separating channels, increasing their length, and reducing the throughput per channel (Col. 8, line 31-35).

Therefore, it would have been obvious at time of the invention to using rotational cyclone of Brouwers for the dual cyclone of Miura in order to obtain the above-cited advantage.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu
Art Unit: 1797
Date: October 12, 2007

DUANE SMITH
PRIMARY EXAMINER

10-15-07